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Notes:

1. Untranslatable words are replaced with asterisks (***).
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FULL CONTENTS

[Claim(s)]

[Claim 1]A posture conversion transportation part is constituted by installing two or more unit belt conveyor devices which an endless belt drives in the same direction at a mutually different speed in a parallel state, An article conveying machine, wherein, as for an article laid and conveyed in the state where it straddled on an endless belt of each unit belt conveyor device which constitutes this posture conversion transportation part, an installation posture is gradually changed in the middle of conveyance.

[Claim 2]The article conveying machine according to claim 1, wherein a unit belt conveyor device which constitutes a posture conversion transportation part is provided with drive mechanism whose adjustment of driving speed of an endless belt is enabled respectively.

[Claim 3]Along with a posture conversion transportation part, an attitude detecting means which detects a state of an installation posture of an article which is laid on an endless belt of a unit belt conveyor device, and is conveyed is provided with it, and with the output of this attitude detecting means, The article conveying machine according to claim 2 constituting so that each drive mechanism of a unit belt conveyor device may be controlled, respectively.

[Claim 4]Claim 1, wherein a posture conversion transportation part is constituted combining a unit belt conveyor device which differed in length specification, respectively, and an article conveying machine given in any 1 paragraph of Claim 3.

[Claim 5]While a unit belt conveyor device installed in the central part is provided with drive mechanism which sets driving speed of an endless belt constant, [a posture conversion transportation part] Claim 1 provided with drive mechanism whose adjustment of driving speed of an endless belt a unit belt conveyor device installed in both sides on both sides of this central unit belt conveyor device enables respectively thru/or an article conveying machine given in any 1 paragraph of Claim 4.

[Claim 6]As opposed to a long unit belt conveyor device which a posture conversion transportation part installed in the central part, Claim 1, wherein a unit belt conveyor device

installed in both sides on both sides of this central unit belt conveyor device is constituted by two or more individual belt conveyor devices installed in a column state, respectively thru/or an article conveying machine given in any 1 paragraph of Claim 5.

[Claim 7]The article conveying machine according to claim 6, wherein two or more individual belt conveyor devices are provided with drive mechanism whose adjustment of driving speed of an endless belt is enabled respectively.

[Claim 8]Claim 1 as a posture conversion transportation part constituted the same plane mostly to a preceding paragraph transportation means at a part of conveyance process which installed continuously two or more transportation means which lay and convey an article, wherein insertion arrangement is carried out thru/or an article conveying machine given in any 1 paragraph of Claim 7.

[Claim 9]. [a posture conversion transportation part] [a part of conveyance process which installed continuously two or more transportation means which lay and convey an article] Claim 1, wherein insertion installation is carried out succeeding a direction which intersects perpendicularly to a preceding paragraph transportation means as constitutes the same plane mostly thru/or an article conveying machine given in any 1 paragraph of Claim 7.

[Detailed Description of the Invention]

[0001]

[Industrial Application]This invention relates to the article conveying machine which changed the installation posture of the article in more detail in the middle of conveyance about article conveying machines, such as a belt conveyor device by which the article processed and processed in a fabrication process, a packaging process, etc. is laid, and continuous carrying is carried out.

[0002]

[Description of the Prior Art]In order that the continuation processing treatment device which carries out processing treatment of the assembly of an article, the packing, etc. continuously may supply parts or an article, an item packaging box, etc. continuously and may carry out processing treatment by proper timing, it has article conveying machines, such as a belt conveyor device, for example. Along with the belt conveyor device of a main, a continuation processing treatment device Namely, parts, While the sub belt conveyor device which constitutes the supply line of material, the supply line of a packing box, etc. is attached suitably, along with the main belt conveyor device, proper processes, such as a fabrication process, a boxed process, or a packaging process, are allocated and constituted. A belt conveyor device is laid [firmly] across the belt pulley which rotates the endless belt which consists of a rubber belt, a steel belt, or a cloth belt with a drive motor, is constituted, and an article etc. are laid on this endless belt and it is conveyed.

[0003]In the continuation processing treatment device of a process, since it becomes very huge [a main belt conveyor device], it becomes difficult to also correspond much expenses of building equipment of recombination of not only becoming immense but a process, change, an addition, etc., etc. For this reason, in the conventional continuation processing treatment device, It extends by constituting the belt conveyor device of a main with two or more belt conveyor devices installed in the column state, The device of shortening length was devised by enabling it to correspond reduction easily, or installing a belt conveyor device in the direction which intersects perpendicularly, and connecting.

[0004]By the way, in the packing processing unit of an accessories article, The item packaging box which is the body to be conveyed is supplied on the endless belt of a belt conveyor device, after filling up the inside of an item packaging box with the article of the number of appointed numbers in the middle of conveyance of this item packaging box, a flap is closed, and also a series of work of packing the whole item packaging box is done automatically. In this packing processing unit, when an item packaging box is a rectangle box, in order to do the charge work of an article efficiently, as the side of the longitudinal direction of this item packaging box is met in the conveyance direction, it is laid on the endless belt of a belt conveyor device, and is conveyed. On the other hand, an item packaging box is conveyed, where an installation posture is changed so that it may become parallel from supply of wrapping paper, or the increase in efficiency of involvement work to the conveyance direction during conveyance of a packaging process about the side of the longitudinal direction of this item packaging box.

[0005]Drawing 6 is a figure showing typically conventional packing and packaging device 100 which packs and conveys this item packaging box 102 with wrapping paper, after boxing the bottling food 101 of a predetermined number in the item packaging box 102. The 1st belt conveyor device 103 with which this packing and packaging device 100 constitute a boxed process, The transportation part is constituted by installing the directional change device 105 installed between the tip sides of the 2nd belt conveyor device 104 the back end side of the 2nd belt conveyor device 104 that constitutes a packaging process, and these 1st belt conveyor devices 103 in a column state. [the 1st belt conveyor device 103 and 2nd belt conveyor device 104] It has the endless belts 106 and 107 which have a width dimension which can lay the item packaging box 102, and is laid [firmly], respectively between the belt pulleys 108 and 109 rotated with the drive motor which these endless belts 106 and 107 do not illustrate, and the driven pulley 110 and 111.

[0006]Where the flap 112 is opened wide, by a predetermined interval, to the endless belt 106 of the 1st belt conveyor device 103, the item packaging box 102 is supplied continuously, and is conveyed. The flap 112 is closed by this item packaging box 102 after being stored in good order by the automatic charge device or worker whom the bottling food 101 does not illustrate in the middle of conveyance. The item packaging box 102 in which the flap 112 was closed is transported to the endless belt 107 of the 2nd belt conveyor device 104 via the directional

change device 105 mentioned later, and by the automatic packaging device which is not illustrated, packing is performed and it is produced commercially.

[0007]Much spherical Collot 114 is attached on the plate 113, and the directional change device 105 is constituted. [therefore the item packaging box 102 conveyed by the 1st belt conveyor device 103 where the flap 112 is closed] As a worker shows to drawing 6, an installation posture is changed from the state laid crosswise to the state where it was laid in the longitudinal direction, and it is transported to the 2nd belt conveyor device 104.

[0008]In packing and the packaging device 100 mentioned above, since continuous processing in directional change device 105 portion was not realized, the whole processing time increased and there was a problem that the item packaging box 102 will stagnate in this directional change device 105 portion again. The packing box 102 had to be correctly laid in the prescribed position of the endless belt 107, and had to be transported to the 2nd belt conveyor device 104, and since working efficiency worsened, there were various problems that the stay phenomenon of the item packaging box 102 became remarkable.

[0009][as other conveying machines which changed the installation posture of the body 121 to be conveyed in the middle of conveyance] For example, as shown in drawing 7 and drawing 8, the conveying machine 120 which combined the 1st belt conveyor device 122 and 2nd belt conveyor device 123 in the direction which estranges up and down and intersects perpendicularly mutually, and constituted them is known. That is, the conveying machine 120 is located in the lower part by the side of the tip of the conveyance direction of the 1st belt conveyor device 122, and constitutes the transportation line bent by the right-angled state by locating the back end side and installing the 2nd belt conveyor device 123. The numerals 126 are the driving pulleys by the side of the 1st belt conveyor device 122 that drives the endless belt 124 among a figure, and the numerals 127 are the driving pulleys by the side of the 2nd belt conveyor device 123 that drives the endless belt 125.

[0010]The item packaging box 121 which is the body to be conveyed is laid and conveyed where the side of a longitudinal direction is made parallel to the conveyance direction, for example in the endless belt 124 top of the 1st conveyor device 122. And if the body 121 to be conveyed is conveyed to the tip part of this 1st conveyor device 122, it will fall to the lower part, but is responded to with the endless belt 125 of the 2nd belt conveyor device 123, and is continuously conveyed in the state where it was laid on this endless belt 125.

[0011]In this case, in the endless belt 125 top of the 2nd belt conveyor device 123 that was put together and installed in the direction which intersects perpendicularly to the 1st conveyor device 122, the item packaging box 121 is laid and conveyed, where the crosswise side is made parallel to the conveyance direction. Therefore, in the time of conveyance by the 1st conveyor device 122, and conveyance by the 2nd belt conveyor device 123, the item packaging box 121 will differ in the installation posture over the conveyance direction, and will be conveyed.

[0012]On the other hand, the conveying machine 130 shown in drawing 9 is a conveying machine which bent and constituted the transportation line which conveys the item packaging box 131 which is the body to be conveyed in the right-angled state, While installing the tip side of the 2nd belt conveyor device 133 in the direction which intersects perpendicularly to the back end side of the 1st belt conveyor device 132, Insertion installation of the directional change device 134 is carried out between these 1st belt conveyor devices 132 and the 2nd belt conveyor device 133, and the transportation line is constituted.

[0013]As for the 1st belt conveyor device 132 and 2nd belt conveyor device 133, as the same field is constituted mutually, each endless belt 135 and endless belt 136 combine, and are installed. Much spherical Collot 138 is attached on the fan-shaped plate 137, and the directional change device 134 is constituted.

The same side is mutually constituted with the endless belt 135 of the 1st belt conveyor device 132 and the 2nd belt conveyor device 133, and the endless belt 136.

[0014]The driving pulley in which the numerals 139 in a figure drive the endless belt 135 of the 1st belt conveyor device 132, and the numerals 140 are driving pulleys which drive the endless belt 136 of the 2nd belt conveyor device 133. 141 is a vertical wall which is set up by the circle peripheral part of the directional change device 134, and prevents omission of the item packaging box 131.

[0015]The item packaging box 131 which is the body to be conveyed is laid, for example on the endless belt 135 of the 1st conveyor device 142, and is conveyed. And if the body 131 to be conveyed is conveyed to the tip part of this 1st conveyor device 132, it will be transported by that vigor to up to the plate 137 of the directional change device 134. As shown in drawing 9 using spherical Collot 138 of the directional change device 134, an installation posture is changed, and the item packaging box 131 is transported to up to the endless belt 136 of the 2nd belt conveyor device 133.

[0016]In drawing 9, the item packaging box 131 was made to operate posture conversion in directional change device 134 portion with the 1st belt conveyor device 132 and 2nd belt conveyor device 133 so that the installation posture over the conveyance direction might be conveyed in the same state, but. [the box] An installation posture is changed like the conveying machine 120 mentioned above depending on the convenience of the process by the side of the latter part, and it may be conveyed.

[0017]

[Problem to be solved by the invention][the conveying machine 120 which combined the 1st belt conveyor device 122 and 2nd belt conveyor device 123 that were mentioned above in the direction which estranges up and down and intersects perpendicularly mutually, and constituted them] It is possible to change an installation posture, conveying continuously the item packaging box 121 which is the body to be conveyed without a worker intervening in the

middle of conveyance.

[0018]However, in this conveying machine 120, since fall operation of the item packaging box 121 is carried out from the 1st belt conveyor device 122 to the 2nd belt conveyor device 123, it breaks and there is a problem in application to conveying machines, such as a thing. When it is required to be conveyed where the packaging process etc. are arranged at the 2nd belt conveyor device 123 side and the item packaging box 121 is laid in the regular position, [the conveying machine 120] Since precise position ***** on this 2nd belt conveyor device 123 is difficult, it is not employable. Since a level difference is constituted between the 1st belt conveyor device 122 and the 2nd belt conveyor device 123, the conveying machine 120 has the problem that the measure against inclination processing is needed about the whole transportation line, and structure becomes complicated.

[0019][the conveying machine 130 which bent and constituted the transportation line which, on the other hand, conveys the item packaging box 131 which is the body to be conveyed in the right-angled state] As mentioned above, there is a problem that a worker is required of directional change device 134 portion, or the stay phenomenon of the item packaging box 131 occurs, and also since the directional change device 134 is expensive, the whole cost also becomes large.

[0020]For example, in the conveying machine which processes food etc., each part of a conveying machine must always be cleanly held on hygiene supervision. As mentioned above, [the directional change device 134] [constitute / on the plate 137 / many spherical Collot 138 / attach and] There is a problem that it is very difficult for removing operation, such as dirt adhering to the surface of the plate 137 or each spherical Collot's 138 bearing, to hold cleanly very troublesome.

[0021]Therefore, this invention is proposed for the purpose of providing the article conveying machine which enabled it for a maintenance to be easy and also to constitute a transportation line arbitrarily while enabling conversion of the installation posture of the body to be conveyed automatically by very simple composition in the middle of conveyance.

[0022]

[Means for solving problem]A posture conversion transportation part is constituted by installing the article conveying machine concerning this invention which attained this purpose, where two or more unit belt conveyor devices driven in the same direction at the speed from which an endless belt differs mutually are arranged in parallel.

[0023]The article conveying machine concerning this invention is provided with the drive mechanism whose adjustment of the driving speed of an endless belt the unit belt conveyor device which constitutes a posture conversion transportation part enables respectively, and is constituted.

[0024]Along with a posture conversion transportation part, the article conveying machine concerning this invention is provided with the attitude detecting means which detects the state

of the installation posture of the article which is laid on the endless belt of a unit belt conveyor device, and is conveyed, and is constituted.

[0025]The article conveying machine concerning this invention constitutes a posture conversion transportation part again combining the unit belt conveyor device which differed in length specification, respectively.

[0026]A unit belt conveyor device which installed the article conveying machine concerning this invention in the central part provided with the drive mechanism which sets driving speed of an endless belt constant for a posture conversion transportation part again, While being installed in both sides on both sides of this central unit belt conveyor device, it constitutes from a unit belt conveyor device provided with the drive mechanism whose adjustment of the driving speed of an endless belt is enabled respectively.

[0027]A long unit belt conveyor device with which the article conveying machine concerning this invention installed the posture conversion transportation part in the central part again, It constitutes from a unit belt conveyor device constituted by two or more individual belt conveyor devices which it was installed in both sides on both sides of this central unit belt conveyor device, and were installed in the column state, respectively. Two or more individual belt conveyor devices are provided with the drive mechanism whose adjustment of the driving speed of an endless belt is enabled respectively.

[0028]At a part of conveyance process which installed continuously two or more transportation means which lay an article and convey a posture conversion transportation part, to a preceding paragraph transportation means, as the article conveying machine concerning this invention constitutes the same plane mostly, it carries out insertion arrangement and constitutes again.

[0029]To a preceding paragraph transportation means, mostly, succeeding the direction which intersects perpendicularly as constitutes, the article conveying machine concerning this invention carries out insertion installation, and constitutes the same plane again at a part of conveyance process which installed continuously two or more transportation means which lay an article and convey a posture conversion transportation part.

[0030]

[Function]According to the article conveying machine concerning this invention constituted as mentioned above, the article which is the body to be conveyed is laid and conveyed where each endless belt of a unit belt conveyor device is straddled. Since a unit belt conveyor device drives an endless belt in the same direction at a mutually different speed, it changes the installation posture of an article gradually in the middle of conveyance.

[0031]An article conveying machine enables adjustment of the conversion rate of the installation posture of an article arbitrarily by adjusting the driving speed of the endless belt of each unit belt conveyor device with drive mechanism. An article conveying machine transforms the installation posture of an article in the fixed state by detecting the conversion state of the installation posture of an article and adjusting the driving speed of the endless belt of each unit

belt conveyor device with the attitude detecting means allocated along with the unit belt conveyor device.

[0032]An article conveying machine conveys the body from which the installation posture was changed to be conveyed in support of the unit belt conveyor device installed in the central part.

[0033]

[Working example]Hereafter, the concrete embodiment of this invention is described in detail with reference to Drawings. The embodiment article conveying machine 1 is constituted by three of the 1st unit belt conveyor device 2 mutually installed in the parallel state thru/or the 3rd unit belt conveyor device 4 as shown in drawing 1. The unit belt conveyor device 2 of these 1st thru/or the 3rd unit belt conveyor device 4 are constituted almost like the belt conveyor device of well-known of respectively fundamental composition.

The endless belt 5 thru/or the endless belt 7 laid in the state where the article 20 mentions later is laid [firmly], respectively between the driving pulleys 8, 10, and 12, the driven pulleys 9 and 11, and 13, By driving the driving pulleys 8, 10, and 12 with the drive motor 14 thru/or the drive motor 16, respectively, it is made to run the endless belt 5 thru/or the endless belt 7, and the article 20 is conveyed from the figure left-hand side to right-hand side.

[0034]Although the 1st unit belt conveyor device 2 thru/or the 3rd unit belt conveyor device 4 are not illustrated, it has a drive control section which controls the drive motor 14 thru/or the drive motor 16, respectively.

The running speed of the endless belt 5 thru/or the endless belt 7 is individually adjusted by inputting the control signal mentioned later.

The 1st unit belt conveyor device 2 thru/or the 3rd unit belt conveyor device 4 are constituted so that the endless belt 5 thru/or the endless belt 7 may run at a mutually different speed.

[0035][in this case the 1st unit belt conveyor device 2 thru/or the 3rd unit belt conveyor device 4] The running speed of the endless belt 5 of the 1st unit belt conveyor device 2 installed in the upper part in drawing 1 is most made large, Let gradually the running speed of the endless belt 6 and the endless belt 7 be small toward the 3rd unit belt conveyor device 4 installed in the bottom from the 2nd unit belt conveyor device 3 installed in the central part.

[0036]To the running direction, predetermined carries out interval estrangement and the posture detection sensors 17 and 18 for detecting the installation state of the article 20 conveyed are allocated by the article conveying machine 1. These posture detection sensors 17 and 18 detect passage of the article 20 conveyed by the 1st unit belt conveyor device 2 thru/or the 3rd unit belt conveyor device 4, and send out a detection output to the drive control section of each drive motor 14 thru/or the drive motor 16. The drive motor 14 thru/or the drive motor 16 adjust the running speed of the endless belt 5 thru/or the endless belt 7 with this detection output, respectively.

[0037]As the longitudinal size is an item packaging box of a rectangle almost equal to the width dimension of the 1st unit belt conveyor device 2 thru/or the 3rd unit belt conveyor device 4, etc. and the article 20 is shown in 20A of drawing 1, In the state of intersecting perpendicularly to a running direction, the side of a longitudinal direction is laid and conveyed ranging over the endless belt 5 thru/or the endless belt 7 of the 1st unit belt conveyor device 2 thru/or the 3rd unit belt conveyor device 4.

[0038]As for the article conveying machine 1, the article's 20 passage of the 1st posture detection sensor 17 will send out the detection output from this 1st posture detection sensor 17 to the drive control section of each drive motor 14 thru/or the drive motor 16. The 1st unit belt conveyor device 2 thru/or the 3rd unit belt conveyor device 4 are changed into speed which the running speed of the endless belt 5 thru/or the endless belt 7 mentioned above by this.

[0039][the article 20] [make / the running speed / gradually / toward the 3rd unit belt conveyor device 4 / as mentioned above / from the 1st unit belt conveyor device 2 / small] Rather than the portion supported by the 2nd unit belt conveyor device 3 or the 3rd unit belt conveyor device 4, the portion supported by the endless belt 5 of the 1st unit belt conveyor device 2 precedes, and is conveyed as it is conveyed. By this, the article 20 rotates clockwise gradually, being supported by the endless belt 5 thru/or the endless belt 7 of the 1st unit belt conveyor device 2 thru/or the 3rd unit belt conveyor device 4, and being conveyed, as shown in 20B thru/or 20D of drawing 1. And as shown in 20E of drawing 1, an installation posture is changed and the article 20 is conveyed so that the side of a longitudinal direction may be in a parallel state to a running direction.

[0040]Passage of the 2nd posture detection sensor 18 of the article 20 which an installation posture is changed into the article conveying machine 1, and is conveyed will send out the detection output from this 2nd posture detection sensor 18 to the drive control section of each drive motor 14 thru/or the drive motor 16. The running speed of the endless belt 5 thru/or the endless belt 7 is again changed into a fixed speed by this, and the 1st unit belt conveyor device 2 thru/or the 3rd unit belt conveyor device 4 are conveyed by it in the state of the installation stabilized in the article 20.

[0041]As for the article conveying machine 1 mentioned above, the posture detection sensors 17 and 18 act as a passage detection sensor of the article 20, Although the running speed of the each 1st unit belt conveyor device 2 thru/or the 3rd unit belt conveyor device 4 was adjusted with this and it was considered as the function to detect the installation posture of the article 20 indirectly, the function of the posture detection sensors 17 and 18 is not limited to this function.

[0042]For example, the posture detection sensors 17 and 18 are provided with a light emitting element and a photo acceptance unit, and they detect the installation posture of the article 20 directly, and it may be made to control individually each drive motor 14 thru/or the drive motor 16 by the quantity-of-light difference between incident light and a reflected light. The posture

detection sensors 17 and 18 are constituted by the television monitor etc., and supervise directly the installation posture of the article 20 conveyed by the article conveying machine 1, and it may be made to control each drive motor 14 thru/or the drive motor 16 to individual or the whole.

[0043]Drawing 2 is packing which used for the directional change device the article conveying machine 1 mentioned above, and a figure showing the packaging device 30 typically.

This packing and packaging device 30 are a device which packs and conveys this item packaging box 20 with wrapping paper, after carrying out boxed processing of the bottling food 22 of a predetermined number at the item packaging box 20 which is the body to be conveyed. The 1st belt conveyor device 40 with which this packing and packaging device 30 constitute a boxed process, The article conveying machine 1 as a directional change device installed between the start edge sides of the 2nd belt conveyor device 45 the termination side of the 2nd belt conveyor device 45 that constitutes a packaging process, and these 1st belt conveyor devices 40 is installed and constituted by the column state.

[0044]The 1st belt conveyor device 41 and 2nd belt conveyor device 45 are provided with the endless belt 41 and the endless belt 46 which have a width dimension which can lay the item packaging box 20, respectively. The endless belt 41 of the 1st belt conveyor device 41 is laid [firmly] between the driving pulley 42 and the driven pulley 43 which are driven with the drive motor which is not illustrated, and the run drive of the installation side of the item packaging box 20 is carried out in the direction of the said figure arrow. Similarly, [the endless belt 46 of the 2nd belt conveyor device 45] By the drive motor which is not illustrated, it is laid [firmly] between the driving pulley 47 and the driven pulley 48 which are rotated at the endless belt 41 of the 1st belt conveyor device 41, and uniform velocity, and the run drive of the installation side of the item packaging box 20 is carried out in the direction of the said figure arrow.

[0045]The article conveying machine 1 comprises the 1st three unit belt conveyor device 2 thru/or 3rd belt conveyor device 4 installed by standing in a row, as mentioned above, but let the whole width dimension be the 1st belt conveyor device 40 and the 2nd belt conveyor device 45, and the width. Insertion allocation of the article conveying machine 1 is carried out the back end side of the 1st belt conveyor device 40 by the interval which is a grade from which the item packaging box 20 is not omitted between the tip sides of the 2nd belt conveyor device 45.

[0046][the item packaging box 20 which the article conveying machine 1 was laid in the state of intersecting the side of a longitudinal direction perpendicularly to a running direction, and was transported from the 1st belt conveyor device 40 side] It has the length which changes the side of a longitudinal direction into a parallel state to a running direction, and is sufficient for transporting to the 2nd belt conveyor device 45, and is constituted. In the article conveying machine 1 mentioned above, constituted the 1st unit belt conveyor device 2 thru/or 3rd belt conveyor device 4 so that rate control of "uniform-gear change-uniform velocity" might be

performed by the output of the posture detection sensors 17 and 18, but. In this packing and packaging device 30, it is constituted so that a run drive may be carried out at the speed defined beforehand. Therefore, the posture detection sensors 17 and 18 are made unnecessary especially at the article conveying machine 1.

[0047]From the tip side of the endless belt 41, the 1st belt conveyor device 40 is supplied via the supply line which the item packaging box 20 does not illustrate, where the flap 21 is opened wide. In this case, the item packaging box 20 is laid on this endless belt 41 in the state where the side of a longitudinal direction intersects perpendicularly to the running direction of the endless belt 41, as the numerals 20A of drawing 2 show. As the numerals 20B of drawing 2 show the item packaging box 20 conveyed by the 1st belt conveyor device 40, after being stored in good order by the automatic charge device or worker whom the bottling food 22 does not illustrate in the middle of conveyance, the flap 21 is closed as the numerals 20C of the figure show.

[0048]The item packaging box 20 in which the flap 21 was closed is transported to the article conveying machine 1 from the 1st belt conveyor device 40, as the numerals 20D of drawing 2 show. [the article conveying machine 1 constituted by the 1st unit belt conveyor device 2 thru/or the 3rd unit belt conveyor device 4] When a running speed makes the portion supported by the 1st unit belt conveyor device 2 made large precede and makes it move, as the numerals 20F of drawing 2 show, the item packaging box 20 is gradually rotated in the middle of conveyance, and an installation posture is transformed. In the termination part of the article conveying machine 1, an installation posture is changed to the state where the side of a longitudinal direction is parallel to a running direction, and the item packaging box 20 is transported to the 2nd belt conveyor device 45 from the article conveying machine 1.

[0049]The side of a longitudinal direction is laid on this endless belt 46 in the parallel state to the running direction of the endless belt 46, and the item packaging box 20 is conveyed by the 2nd belt conveyor device 45, as the numerals 20F of drawing 2 show. And by the automatic packaging device which was allocated along with the 2nd belt conveyor device 45 and which is not illustrated, the packing 23 is performed and produced commercially and the item packaging box 20 is conveyed to a latter processing process, as shown in the numerals 20G of drawing 2.

[0050]As mentioned above, packing which used the article conveying machine 1 for the directional change device, and the packaging device 30 are continuously conveyed at a fixed interval, without the item packaging box 20 stagnating on the way, and boxed processing or packing processing of the bottling food 22 is performed efficiently. Since this packing and the packaging device 30 can make the worker in the middle unnecessary and also can also perform cleaning of an endless belt easily, they are maintained at a state with the whole always clean device.

[0051]The article conveying machine 1 mentioned above is combined with two or more sets

and a column state, a transportation line is constituted, and drawing 3 is applied to the assembly which performs an assembly of parts etc. or additional processing to various parts of the substrate which is the body to be conveyed in the middle of conveyance, and a process line, and shows the suitable article conveying machine 50. In an assembly of an industrial commodity and processing, along with a line, processing units, such as a worker or a robot, are arranged suitably, and an assembly of parts etc. or additional processing is performed to the substrate conveyed by a belt conveyor device.

[0052]Where the substrate was taken up from the transportation line by the worker or a handling device or a conveyance posture is changed, an assembly of parts etc. or additional processing is performed. As mentioned above, the article conveying machine 50 an installation posture Two or more sets of article conveying machines 1A convertible in the middle of conveyance, Since it is constituted by 1B, 1C, and .., the installation posture of a base can be arbitrarily changed in the middle of conveyance by setting up the running speed of the 1st unit belt conveyor device 2 that constitutes each article conveying machine 1 thru/or the 3rd unit belt conveyor device 4. Therefore, the article conveying machine 50 can be conveyed, where it was presupposed that a handling device etc. were unnecessary and a base is correctly positioned to a next process.

[0053]It assembles and a routing change is often performed in a process line. As the drawing 3 broken chain line shows the article conveying machine 50 by having constituted combining two or more sets of article conveying machines 1 in the column state, correspondence of conversion of a running direction, etc. is performed very easily.

[0054]The article conveying machine 60 shown in drawing 4 The 1st belt conveyor device 61, It is the article conveying machine which comprises the 2nd belt conveyor device 70 and 3rd belt conveyor device 80 that were together put in the direction which intersects perpendicularly mutually, and conveyed continuously the item packaging box 20 which is the body to be conveyed to the right angle direction. The 1st belt conveyor device 61 carries out the run drive of the endless belt 62 laid [firmly] by the driving pulley 63 driven with the drive motor which is not illustrated. As the numerals 20A of the figure show, the item packaging box 20 is laid on the endless belt 62 in the state where the side of a longitudinal direction intersects perpendicularly to a running direction, and is conveyed in the direction of the said figure arrow.

[0055]The 2nd belt conveyor device 70 is constituted by three of the 1st unit belt conveyor device 71A mutually installed in the parallel state thru/or the 3rd unit belt conveyor device 71C. [these unit belt conveyor device 71 (71A thru/or 71C)] The endless belt 72 (72A thru/or 72C) is laid [firmly], respectively between the driving pulley 73 (73A thru/or 73C) and the driven pulley 74 (74A thru/or 74C), By driving the driving pulley 73 with the drive motor which is not illustrated, respectively, it is made to run the endless belt 72 and the item packaging box 20 is conveyed from the figure left-hand side to right-hand side.

[0056]The 1st unit belt conveyor device 71A thru/or the 3rd unit belt conveyor device 71C differ

in a linear dimension, respectively.

The start edge side is made into the same position, and it is mutually installed in the parallel state.

The 1st unit belt conveyor device 71A thru/or the 3rd unit belt conveyor device 71C differ in the running speed of the endless belt 72. In this case, it is the longest, and the running speed of the endless belt 72A is also the largest, and the 1st unit belt conveyor device 71A is set up. And the running speed of the endless belt 72B of the 2nd unit belt conveyor device 71B installed in the central part is also large for a long time to the 3rd unit belt conveyor device 71C.

[0057]The 3rd belt conveyor device 80 is also constituted by the three unit belt conveyor devices 81A thru/or the unit belt conveyor device 81C mutually installed in the parallel state. [these unit belt conveyor device 81 (81A thru/or 81C)] It is supported by the middle belt pulley 85 (85A thru/or 85C) while the endless belt 82 (82A thru/or 82C) is laid [firmly], respectively between the driving pulley 83 (83A thru/or 83C) and the driven pulley 84 (84A thru/or 84C), By driving the driving pulley 83 with the drive motor which is not illustrated, respectively, it is made to run the endless belt 82 and the item packaging box 20 is conveyed from the figure upper part side to the lower part side.

[0058]The 1st unit belt conveyor device 81A thru/or the 3rd unit belt conveyor device 81C differ in a linear dimension, respectively. The 1st unit belt conveyor device 81A is arranged in the state where it intersects perpendicularly with it as the start edge part adjoins the termination part of the 1st unit belt conveyor device 71A that constitutes the 2nd belt conveyor device 70. Similarly, the 2nd unit belt conveyor device 81B is arranged in the state where it intersects perpendicularly with it as the start edge part adjoins the termination part of the 2nd unit belt conveyor device 71B that constitutes the 2nd belt conveyor device 70. The 3rd unit belt conveyor device 81C is arranged in the state where it intersects perpendicularly with it as the start edge part adjoins the termination part of the 3rd unit belt conveyor device 71C that constitutes the 2nd belt conveyor device 70.

[0059]According to the article conveying machine 60 constituted as mentioned above, as the numerals 20A of drawing 4 show, the item packaging box 20 is laid on the endless belt 62 in the state where the side of a longitudinal direction intersects perpendicularly to a running direction, and is conveyed by the 1st belt conveyor device 61. The item packaging box 20 is transported to the 2nd belt conveyor device 70 from the termination part of the 1st belt conveyor device 61. [the 2nd belt conveyor device 70 constituted by the 1st unit belt conveyor device 71A thru/or the 3rd unit belt conveyor device 71C] When a running speed makes the portion supported by the 1st unit belt conveyor device 71A made large precede and makes it move, as the numerals 20B and 20C of drawing 4 show, the item packaging box 20 is gradually rotated in the middle of conveyance, and an installation posture is transformed.

[0060]In the termination part of the 2nd belt conveyor device 70, an installation posture is

changed to the state where the side of a longitudinal direction is parallel to a running direction, and the item packaging box 20 is transported to the 3rd belt conveyor device 80 from this 2nd belt conveyor device 70, as the numerals 20D of drawing 4 show. When the 1st unit belt conveyor device 81A thru/or the 3rd unit belt conveyor device 81C which constitutes the 3rd belt conveyor device 80 is made into the same running speed here, respectively, The item packaging box 20 will be supported and conveyed where the endless belt 82A thru/or the endless belt 82C of each unit belt conveyor device 81 is straddled, as the numerals 20E of the figure show.

[0061]When the 1st unit belt conveyor device 81A thru/or the 3rd unit belt conveyor device 81C which constitutes the 3rd belt conveyor device 80 differs in a running speed, respectively and is constituted, on the other hand, [the article conveying machine 60] The installation posture of the item packaging box 20 will be again changed while being conveyed by this 3rd belt conveyor device 80. In this case, if the running speed is gradually turned on the 3rd unit belt conveyor device 81C side with smallness from the 1st unit belt conveyor device 81A, an installation posture will be changed into the item packaging box 20 to the state where the side of a longitudinal direction intersects perpendicularly to a running direction, rotating clockwise in drawing 4. If the running speed is gradually turned on the 3rd unit belt conveyor device 81C side with size from the 1st unit belt conveyor device 81A, an installation posture will be changed into the item packaging box 20 to the state where the side of a longitudinal direction intersects perpendicularly to a running direction, rotating counterclockwise in drawing 4.

[0062]The article conveying machine 60 constituted as mentioned above is made possible [changing the conveyance direction into a right angle direction, and conveying it], conveying the body to be conveyed continuously again without stationing a worker. The article conveying machine 60 can set up the installation posture over the conveyance direction arbitrarily, after bending and conveying the body to be conveyed to a right angle direction.

[0063]The embodiment article conveying machine 90 shown in drawing 5 is constituted by the 1st unit belt conveyor device 91 thru/or the 3rd unit belt conveyor device 93 mutually installed in the parallel state. In the 1st embodiment article conveying machine 1 mentioned above, the posture detection sensors 17 and 18 are allocated for the rate control of "uniform-gear change-uniform velocity", and it constitutes so that a drive control section may be controlled by the output of these posture detection sensors 17 and 18.

[0064]On the other hand, although the embodiment article conveying machine 90 constitutes the 2nd unit belt conveyor device 92 installed in the central part with one belt conveyor device, [the conveying machine] The individual belt conveyor device 91A thru/or the individual belt conveyor device 91C and the individual belt conveyor device 93A thru/or the individual belt conveyor device 93C of a group constitutes two or more the 1st unit belt conveyor device 91 and the 2nd unit belt conveyor device 93 which are installed in the both sides, respectively. In the figure, about the member which does not require explanation in particular, it is drawing 1

and an equivalent member and explanation is omitted by attaching the same number.

[0065]As for the embodiment article conveying machine 90, the running speed of each belt conveyor device is set up as follows.

[0066]running speed [of the 2nd unit belt conveyor device 92] = -- the -- running speed [of the 1st individual belt conveyor device 91A that constitutes the unit belt conveyor device 91 of one] = -- the -- running speed [of the 3rd individual belt conveyor device 91C that constitutes the unit belt conveyor device 91 of one] = -- the. [three] [unit belt conveyor device] running speed [of the 1st individual belt conveyor device 93A that constitutes 93] = -- the -- the running speed of the 3rd individual belt conveyor device 93C that constitutes the unit belt conveyor device 93 of three.

[0067]the [of the 2nd individual belt conveyor device 91B that constitutes the 1st unit belt conveyor device 91 / running speed >] -- the [of the unit belt conveyor device 92 of two / running speed >] -- the running speed of the 2nd individual belt conveyor device 93B that constitutes the unit belt conveyor device 93 of three.

[0068]According to the embodiment article conveying machine 90 constituted as mentioned above, [the item packaging box 20] As shown in 20A of drawing 5, [the state where the side of a longitudinal direction intersects perpendicularly to a running direction] It is laid and conveyed ranging over the 1st individual belt conveyor device 93A of the 1st individual belt conveyor device 91A of the 1st unit belt conveyor device 91, the 2nd unit belt conveyor device 92, and the 3rd unit belt conveyor device 93.

[0069]The item packaging box 20 will carry out rotation operation to a clockwise rotation gradually, if a part for the vertical section is conveyed to the start edge part of the 2nd individual belt conveyor device 91B of the 1st unit belt conveyor device 91, and the 2nd individual belt conveyor device 93B of the 3rd unit belt conveyor device 93.

[0070][namely the 2nd unit belt conveyor device 92, the 2nd individual belt conveyor device 91B, and the 2nd individual belt conveyor device 93B] Since it is set to the running speed mentioned above, respectively, [the item packaging box 20] As it is conveyed, [the portion supported by the 2nd individual belt conveyor device 91B that constitutes the 1st unit belt conveyor device 91] It is preceded and conveyed rather than the portion supported by the 2nd individual belt conveyor device 93B that constitutes the 2nd unit belt conveyor device 92 or the 3rd unit belt conveyor device 93. By this, the item packaging box 20 rotates clockwise gradually, being conveyed by the 1st unit belt conveyor device 91 thru/or the 3rd unit belt conveyor device 93, as shown in 20B thru/or 20D of drawing 5. And as shown in 20E of drawing 5, an installation posture is changed and the item packaging box 20 is conveyed so that the side of a longitudinal direction may be in a parallel state to a running direction.

[0071]If the item packaging box 20 is conveyed to the start edge part of the 3rd individual belt conveyor device 91C of the 1st unit belt conveyor device 91, and the 3rd individual belt conveyor device 93C of the 3rd unit belt conveyor device 93, From being set to the same

running speed, as these individual belt conveyor devices 91C and 93C and the 2nd unit belt conveyor device 92 mentioned above, it is held at the stable installation posture and conveyed to the latter-part side. Therefore, it makes it possible to be a fixed bearer rate and to convey the item packaging box 20 continuously while conversion of the installation posture of the item packaging box 20 of the article conveying machine 90 is enabled using a posture detection sensor or a drive control section as especially unnecessary.

[0072]

[Effect of the Invention]As explained to details above, according to the article conveying machine concerning this invention, with a very easy and cheap device, Since an installation posture is gradually changed in the middle of conveyance, generating of the stay phenomenon of the article in a transportation line is prevented, it assembles, and, as for an article, a series of continuous processes, such as additional processing or packing, are realized efficiently. Since the article from which the installation posture was changed in the middle of conveyance is conveyed in the state where it was correctly positioned to the next process, it is processed in the good state according to a next process, without forming an alignment device etc.

[0073]According to the article conveying machine concerning this invention, since the endless belt of the belt conveyor device which lays and conveys an article can be cleaned easily and it can always hold cleanly, it applies to the processing unit of foodstuffs, etc. and is very suitable. As for the article conveying machine concerning this invention, it is ***** that can make a change of a transportation line, etc. easily and they correspond a routing change promptly.

[Brief Description of the Drawings]

[Drawing 1]It is an important section top view for explaining typically the fundamental composition of the article conveying machine concerning this invention.

[Drawing 2]It is an important section top view for explaining typically the fundamental composition of packing and the packaging device which adopted the article conveying machine as a posture converter of an item packaging box.

[Drawing 3]It is an important section top view for explaining typically the fundamental composition of the article conveying machine constituted combining the article conveying machine two or more sets.

[Drawing 4]It is an important section top view for explaining typically the fundamental composition of the article conveying machine which constitutes the transportation line bent by the right angle direction provided with the article conveying machine.

[Drawing 5]It is an important section top view for explaining typically the fundamental composition of other embodiments of the article conveying machine concerning this invention.

[Drawing 6]It is an important section top view for explaining typically the fundamental composition of conventional packing and packaging device.

[Drawing 7] It is an important section perspective view of the conventional article conveying machine which changes an installation posture in the middle of conveyance.

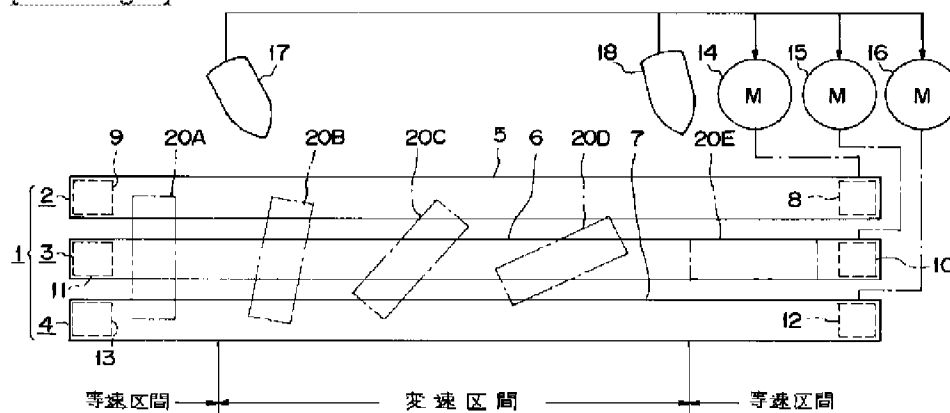
[Drawing 8] It is an important section top view for explaining the article conveying machine typically.

[Drawing 9] It is an important section top view for explaining typically other conventional article conveying machines which change an installation posture in the middle of conveyance.

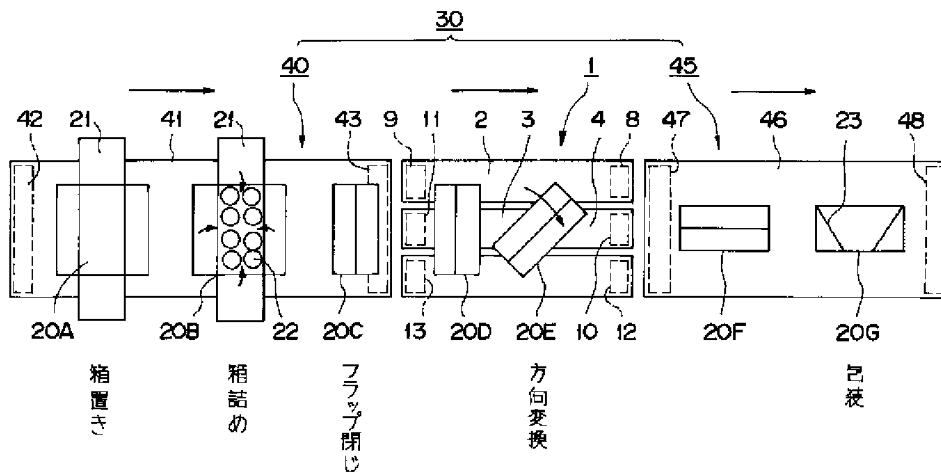
[Explanations of letters or numerals]

- 1 Article conveying machine
- 2 1st unit belt conveyor device
- 3 2nd unit belt conveyor device
- 4 3rd unit belt conveyor device
- 5 Endless belt of 1st unit belt conveyor device
- 6 Endless belt of 2nd unit belt conveyor device
- 7 Endless belt of 3rd unit belt conveyor device
- 8 Driving pulley of 1st unit belt conveyor device
- 9 Driven pulley of 1st unit belt conveyor device
- 10 Driving pulley of 2nd unit belt conveyor device
- 11 Driven pulley of 2nd unit belt conveyor device
- 12 Driving pulley of 3rd unit belt conveyor device
- 13 Driven pulley of 3rd unit belt conveyor device
- 14 Drive motor of 1st unit belt conveyor device
- 15 Drive motor of 2nd unit belt conveyor device
- 16 Drive motor of 3rd unit belt conveyor device
- 20 Item packaging box (body to be conveyed, article)

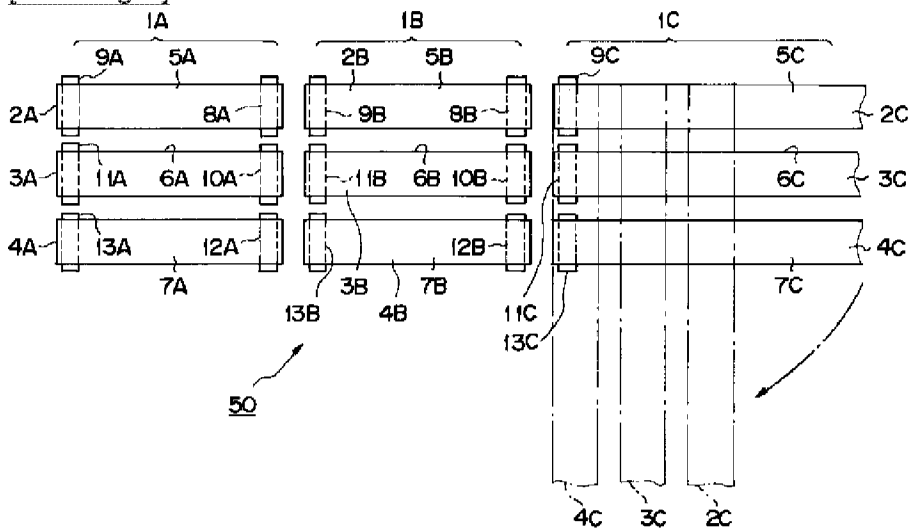
[Drawing 1]



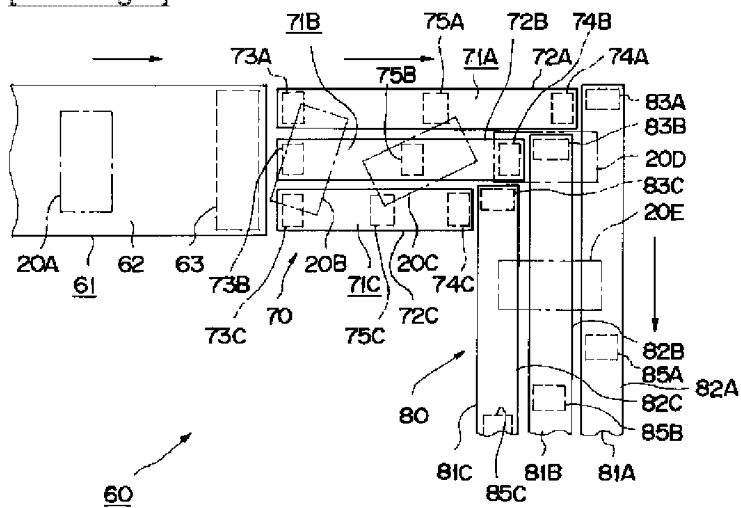
[Drawing 2]



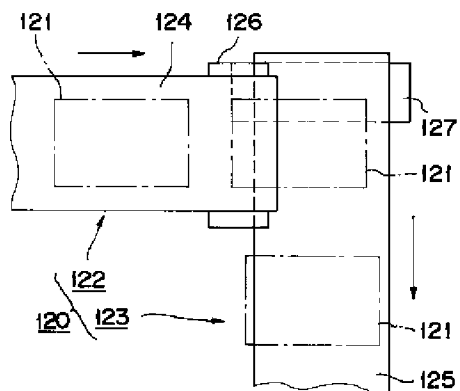
[Drawing 3]



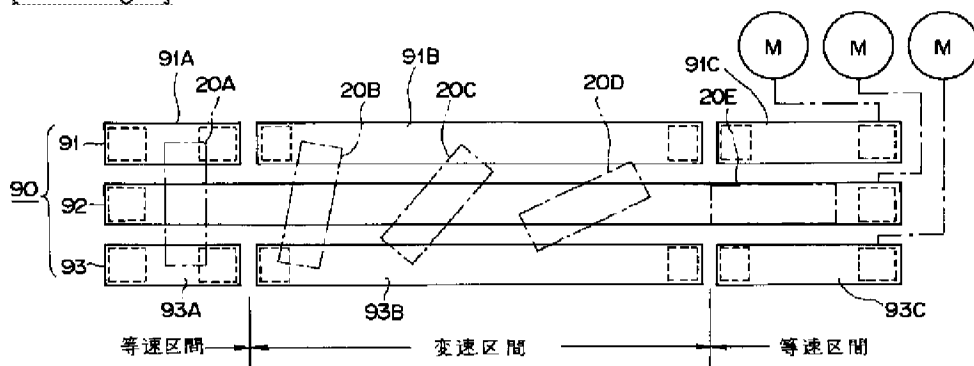
[Drawing 4]



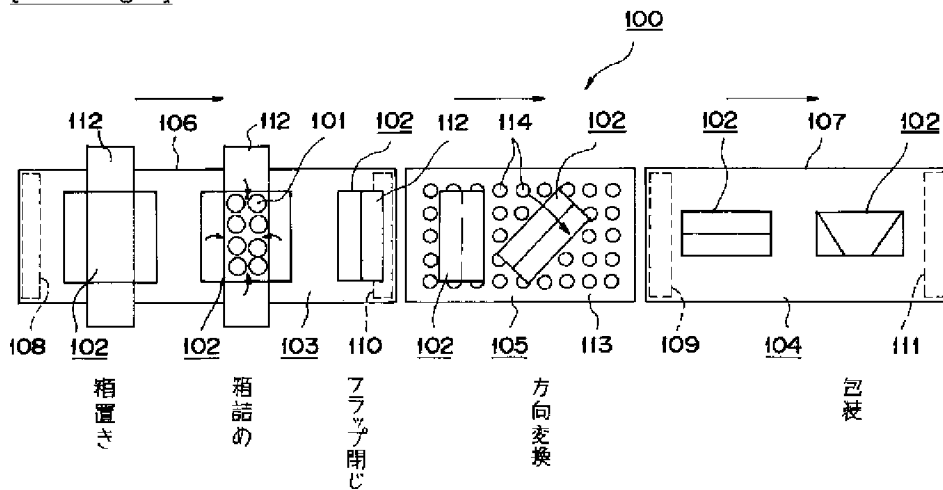
[Drawing 8]



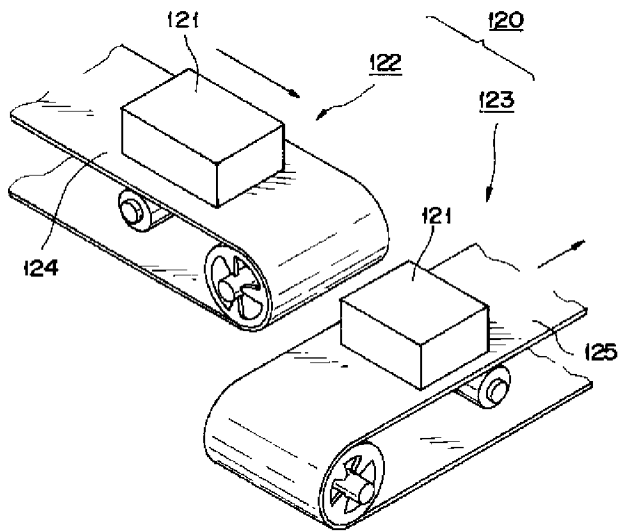
[Drawing 5]



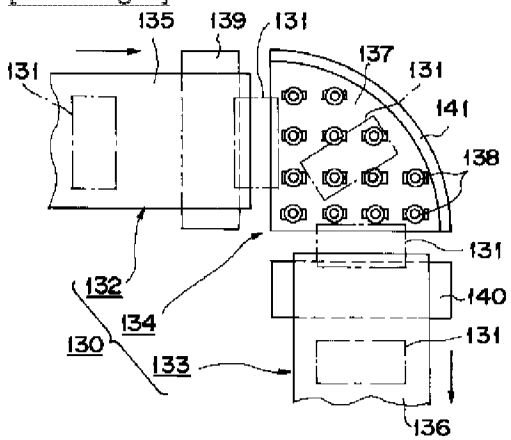
[Drawing 6]



[Drawing 7]



[Drawing 9]



[Translation done.]